

Group Discussion: Formulating the Problem & the Strategy for Solution

23 April 2002

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Goals

- Elicit how the draft CoBP might be
 - Added to
 - Subtracted from
 - Modified
- Identify steps that might be taken to further illuminate or clarify the subject
- Identify key issues that might be the subject of future SAS panels

Agenda

- Problem Formulation (What & Why)
 - Context
 - Aspects of the Problem
 - Principles of Problem Formulation
 - C2 Assessment
 - OOTW C2 Assessment
 - Bounding the Problem
 - High Level MoM
 - Tools for Problem Formulation
- Solution Strategy (How)
 - Developing a solution strategy
 - Study Management Plan

Context

- Four *contextual* areas have been identified
 - Geopolitical
 - Analysis aim, objectives
 - Generic C2 issues
 - Relevant prior studies

Are these areas necessary and sufficient?

Aspects of the Problem

- Five *aspects* of the problem have been identified
 - Issues to be addressed
 - Assumptions
 - High level MoMs
 - Independent variables
 - Constraints on the variables
- Statement: “The problem is not formulated until the Assessment Team has specified each aspect of the problem” -- *Do you agree or disagree?*

Principles of Problem

Formulation: C2 Assessment

- Do it prior to developing concepts for analysis or model selection
- Understand the decisions to be supported and stakeholder viewpoints
- Carefully review previous work
- Do analysis *and* synthesis
- Be broad and iterative
- Practical constraints are modifiers, not drivers
- Address risks to the study explicitly

Is this list correct and comprehensive?

Principles of Problem Formulation: OOTW C2 Assessment

- Address the
 - Geopolitical context
 - Generic C2 issues
- Look at the policy level impacts (i.e., MOPEs)
- Recognize that history can be important
- Do not focus in too soon
- Employ a broad range of disciplines on the team

Is this list correct and complete?

Assembling a Multi-Disciplinary Team Can Be Challenging...



“But I don’t want to do C2 assessment!”

Notes for Slide 9

As many of you know, members of the Synthesis Panel have a “daytime job” and a “night-time job”. During the day, each member of the panel is assigned to one of the six mission oriented panels. During off-hours we meet to share insights and develop a holistic view of the subject. Thus, recruiting can be difficult, requiring unorthodox approaches.

Bounding the Problem

- Explore and understand the significance of each boundary before making assumptions about it
- Recognize that in formulating an OOTW problem, we are trying to bound a complex system
- Avoid the trap of over-specification
- Care must be taken to avoid coming to closure prematurely

Comments?

High Level MoM

- In order to construct appropriate MoM, conduct a structured analysis of potential benefits; causally map
 - Lower level MoM (that can be related to investments or other action) to
 - Higher level MoM (that can be valued by decisionmakers)

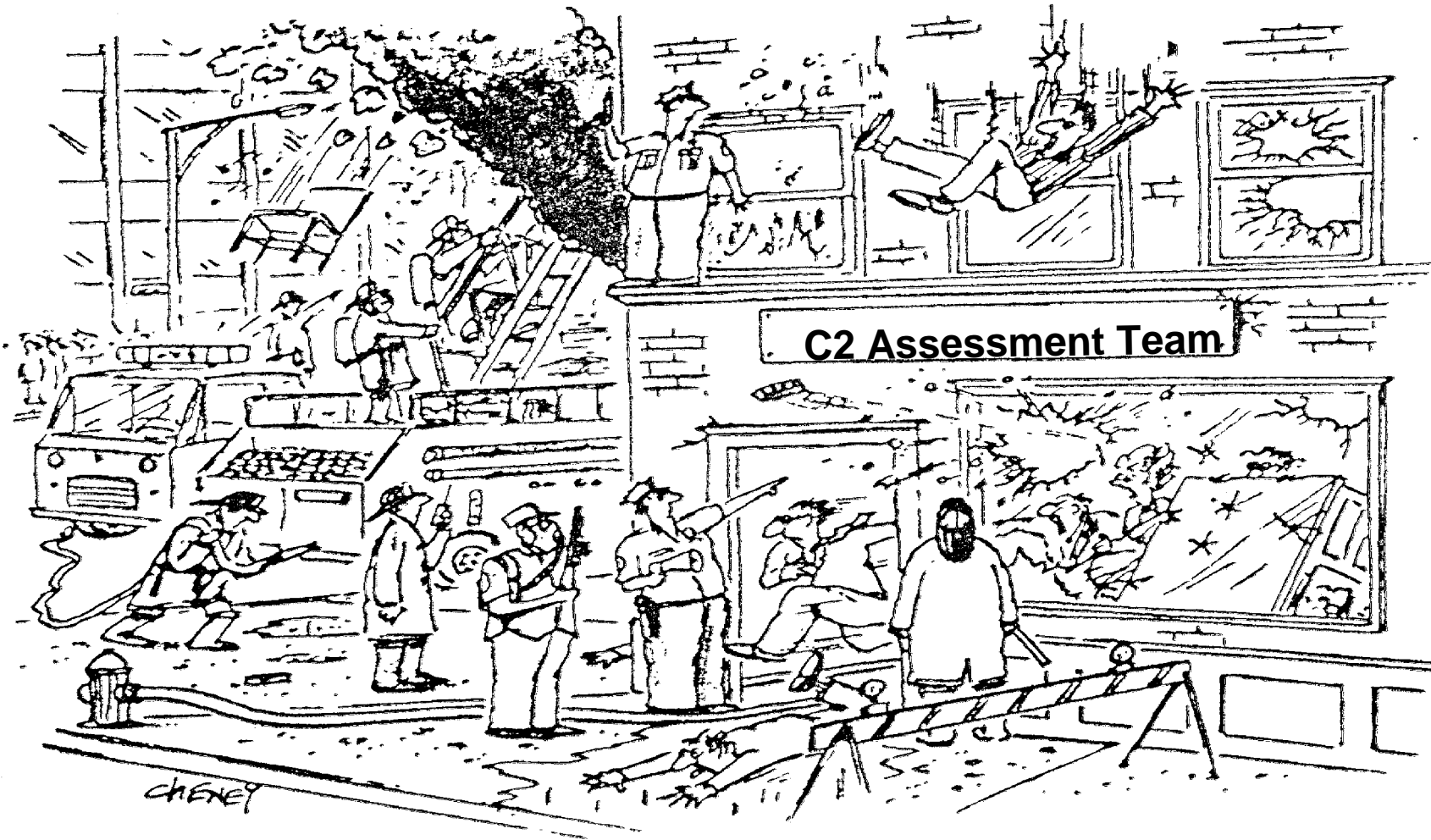
Comments?

Tools for Problem Formulation

- Several tools were cited; e.g.,
 - Elicitation support
 - Influence diagrams
 - Casual maps
 - System dynamic models
 - Agent based ‘distillations’

Are there any other important tools to cite?

The C2 Assessment Process Can Be Chaotic Without a Solution Strategy



Notes for Slide 14

In contrast to the other panels, the Synthesis Panel was very tactical in its operations (i.e., it responded to the “crisis de jour”).

Developing a Solution Strategy

- A solution strategy must be *iterative*, consisting of
 - The detailed specification of the MoM
 - The development of a conceptual model (including the relevant human and organisational factors)
 - The specification of a set of scenarios
 - A data collection and analysis plan (including the methods and tools to be used)
- The strategy needs to be *tested* to see if it addresses the issues at hand
 - Within schedule and resource constraints
 - With acceptable levels of uncertainty and risk

Do you concur?

Study Management Plan

- The team should create and maintain a Study Management Plan that contains
 - Study glossary
 - Analysis plan
 - Tool deployment and modelling and simulation plan
 - Data collection/engineering plan
 - Configuration management plan
 - Study risk register
 - Quality assurance plan
 - Security plan
 - Review plan
 - Plan of deliverables

Is this list correct and complete?

Summary

- Comments?
- Questions?
- Areas of concern?

C2 Problem Formulation Tends to be Complex, Poorly Defined



**“Vacuums, black holes, antimatter, C2 problem formulation —
It’s the elusive and intangible which appeals to me”**

Group Discussion on “Formulating the Problem and the Strategy for Solution”

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